

INFUSION DEVICE SYSTEM AND APPARATUS

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] The present application Continuation of U.S. patent application Ser. No. 14/996,559, filed Jan. 15, 2016, now U.S. Pat. No. 10,413,661, issued Sep. 17, 2019 and entitled Apparatus, System and Method for Fluid Delivery (Attorney Docket No. R28) which is a Non-provisional application which claims priority from U.S. Provisional Patent Application Ser. No. 62/103,841, filed Jan. 15, 2015 and entitled Infusion Pump Assembly (Attorney Docket No. M92), which is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] This application relates generally to fluid delivery systems, and more particularly to an infusion pump assemblies and infusion devices, systems and apparatus.

BACKGROUND

[0003] Many potentially valuable medicines or compounds, including biologicals, are not orally active due to poor absorption, hepatic metabolism or other pharmacokinetic factors. Additionally, some therapeutic compounds, although they can be orally absorbed, are sometimes required to be administered so often it is difficult for a patient to maintain the desired schedule. In these cases, parenteral delivery is often employed or could be employed.

[0004] Effective parenteral routes of drug delivery, as well as other fluids and compounds, such as subcutaneous injection, intramuscular injection, and intravenous (IV) administration include puncture of the skin with a needle or stylet. Insulin is an example of a therapeutic fluid that is self-injected by millions of diabetic patients. Users of parenterally delivered drugs may benefit from a wearable device that would automatically deliver needed drugs/compounds over a period of time.

[0005] To this end, there have been efforts to design portable and wearable devices for the controlled release of therapeutics. Such devices are known to have a reservoir such as a cartridge, syringe, or bag, and to be electronically controlled. These devices suffer from a number of drawbacks including the malfunction rate. Reducing the size, weight and cost of these devices is also an ongoing challenge. Additionally, these devices often apply to the skin and pose the challenge of frequent re-location for application.

SUMMARY OF THE INVENTION

[0006] In accordance with first implementation, an infusion device system is disclosed. The infusion device system includes a disposable housing assembly comprising an infusion device mating assembly attached to the disposable housing assembly comprising a piercing needle and a reservoir, wherein the piercing needle fluidly connected to the reservoir; and an infusion device including a top portion comprising an introduction needle and a bottom portion including a septum and a cannula, the top portion removably attached to the bottom portion. Wherein the introduction needle is used to insert the cannula, and wherein after insertion, the top portion is removed from the bottom portion, wherein the infusion device mating assembly con-

figured to attach to the bottom portion of the infusion device, wherein the piercing needle configured to pierce the septum, and wherein when the infusion device mating assembly is attached to the bottom portion of the infusion device, the cannula is fluidly connected to the reservoir.

[0007] Some embodiments of this implementation include one or more of the following. Wherein the system further includes a predetermined length of tubing comprising a first end and a second end. Wherein the the first end of the tubing configured to attach to the bottom portion of the infusion device and the second end of the tubing configured to attach to the infusion device mating assembly. Wherein the second end of the tubing configured to attach to the piercing needle, wherein the tubing is fluidly connected to the reservoir. Wherein the system further includes an autoinsertor. Wherein the system further includes a reusable housing assembly configured to removably attach to the disposable housing assembly. Wherein the reusable housing assembly includes a volume sensor assembly. Wherein the disposable housing assembly includes a pumping chamber.

[0008] In accordance with another implementation, an infusion device system is disclosed. The infusion device system includes a disposable housing assembly including an infusion device mating assembly attached to the disposable housing assembly comprising a piercing needle and a reservoir, wherein the piercing needle fluidly connected to the reservoir. The system also includes a reusable housing assembly configured to removably attach to the disposable housing assembly and an infusion device. The infusion device includes a top portion including an introduction needle and a bottom portion including a septum and a cannula, the top portion removably attached to the bottom portion. Wherein the introduction needle is used to insert the cannula, and wherein after insertion, the top portion is removed from the bottom portion, wherein the infusion device mating assembly configured to attach to the bottom portion of the infusion device, wherein the piercing needle configured to pierce the septum, and wherein when the infusion device mating assembly is attached to the bottom portion of the infusion device, the cannula is fluidly connected to the reservoir.

[0009] Some embodiments of this implementation include one or more of the following. Wherein the infusion device system further includes a predetermined length of tubing including a first end and a second end. Wherein the the first end of the tubing configured to attach to the bottom portion of the infusion device and the second end of the tubing configured to attach to the infusion device mating assembly. Wherein the second end of the tubing configured to attach to the piercing needle, wherein the tubing is fluidly connected to the reservoir. Wherein the system further including an autoinsertor. Wherein the reusable housing assembly including a volume sensor assembly. Wherein the disposable housing assembly including a pumping chamber.

[0010] In accordance with first implementation, an infusion device is disclosed. The infusion device includes a top portion including an introduction needle and a bottom portion comprising a septum and a cannula, the top portion removably attached to the bottom portion, wherein the introduction needle is used to insert the cannula, and wherein after insertion, the top portion is removed from the bottom portion, wherein the bottom portion configured to attach to an infusion device mating assembly of an infusion pump assembly, wherein when the infusion device mating